S962A

SERVICE MANUAL

CTX The Monitor Specialists

EDITION 1
DEC. 2003

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1. SCOPE

This specification defines the design and performance requirements for the 19" SXGA TFT LCD display monitor "S962A ".

The features of "S962A" is listed in the following table:

Feature	Description
1	Universal input AC/DC power supply inside the monitor
2	Analog RGB interface (VGA) 30~80KHz, 59~75Hz, 135MHz
3	19" SXGA 1280*1024, TFT LCD panel
4	Function keys * 5 : Power On/Off, ESC, △ (up), ▽ (down), ↵(enter)
5	Direct Acess function keys : △ for ◐ contrast function, ▽ for ☼ brightness function , ESC for audio mute function
6	Green/Amber LED indicator for power on/power saving
7	Plug & play support with DDC2B protocol installed.
8	Power saving mode compliant with Energy Star
9	OSD (on screen display) MENU operation
9.1	Brightness adjustment
9.2	Contrast adjustment
9.3	Auto tune function (VGA)
9.4	Color selection
9.5	Image adjustment
9.6	Language selection
9.7	OSD position adjustment
9.8	Reset function
9.9	1W * 2 Audio function inside the monitor
9.10	Volume adjust by OSD

2. INPUT REQUIREMENTS

2.1 Input Power

2.1.1. Power Source	100 ~ 240 Vac, + -10%, 50/60 Hz
2.1.2. Power Consumption	Normal operating mode Audio function is operating at max output: ≦ 43W w/o audio function: ≦ 36W Power saving mode Audio function is operating at max output: ≦ 7W w/o audio function: ≦ 2W Power switch off: ≦ 1.5W
2.1.3. AC Line Drop Out	Picture must not disappear while AC 100 V input drop out(10ms, 100%)
2.1.4. AC Wave Distortion	
2.1.5. In-rush Current	10% max. Permitted
2.1.6. Power Cord	50 A max at 240 Vac cold start Detachable, 3P with ground type.

2.2 Display Input

2.2.1. Analog Input RGB Video	Analogue, 0.0 to 0.7 V peak to peak Separate RGB Input impedance 75 Ohm Positive polarity
2.2.1.1 Sync Signal	Separate horizontal & vertical sync (3.3V & 5V) Low level 0.8 V maximum High level 2.0 V minimum Positive or negative polarity

Analog Input Connection

a. Captive cable length 1.5M in LCD Monitor end, D-sub male connector in another end.
b. A female Mini D-sub 15 pin base.

Pin 1	Red	Pin 9	No Connection
Pin 2	Green	Pin 10	Ground
Pin 3	Blue	Pin 11	Ground
Pin 4	No Connection	Pin 12	SDA
Pin 5	Ground	Pin 13	H. Sync
Pin 6	R Return		
Pin 7	G Return	Pin 14	V. Sync
Pin 8	B Return	Pin 15	SCL

2.3 Audio Input

2.3.1 Audio Input Signal

Right &Left channels.

Input level: 1Vrms(typ), 2Vrms(max)

Input Impedance: 15Kohm

2.3.2 Audio Input Connection

a. Detachable stereo phone head in two ends signal cable.

b. A female stereo phone jack base.

3. ELECTRICAL CHARACTERISTICS

3.1 LCD Panel

3.1.1. Type	19” diagonal, SXGA resolution, color TFT-LCD
3.1.2. Pixel structure	R/G/B sub-pixels in vertical stripes 1280 x 1024 array matrix a-Si TFT active matrix
3.1.3. Gray scale	16.7 million colors.
3.1.4. Surface treatment	3H hard coating, anti-static,anti-glare
3.1.5. Backlight	Integral CCFL, type to support field replacement. Life time 30000 hours @ 25C, 50% of initial value.

3.1.6 Pixel Faults

Model / Project / Pixel Faults type		S962A LBL19SS4HA01
Type1	Bright Pixels (Note 1)	≦ 5
Type2	Dark Pixels (Note 2)	≦ 5
Type3	Fault Pixels / Sub-Pixels (Note 3)	≦ 3
Type4	Cluster of type1 or type 2 faults (Note 4)	≦ 2
Type5	Cluster of type3 faults (Note4)	≦ 3
Type6	Total Pixel Faults	≦ 8

Note 1: Bright pixels in full black pattern.
Note 2: Dark pixels in full white pattern
Note 3: fault Pixel / Sub-Pixel: The pixel or sub-pixel is abnormal but not bright/dark pixel.
Note 4: Fault Cluster: Two or more Pixels/Sub-pixels with faults within 5 * 5 block of pixels.

3.2 Modes and Timing Comparability

3.2.1Analog Input Supported Timing VESA Standard mode:

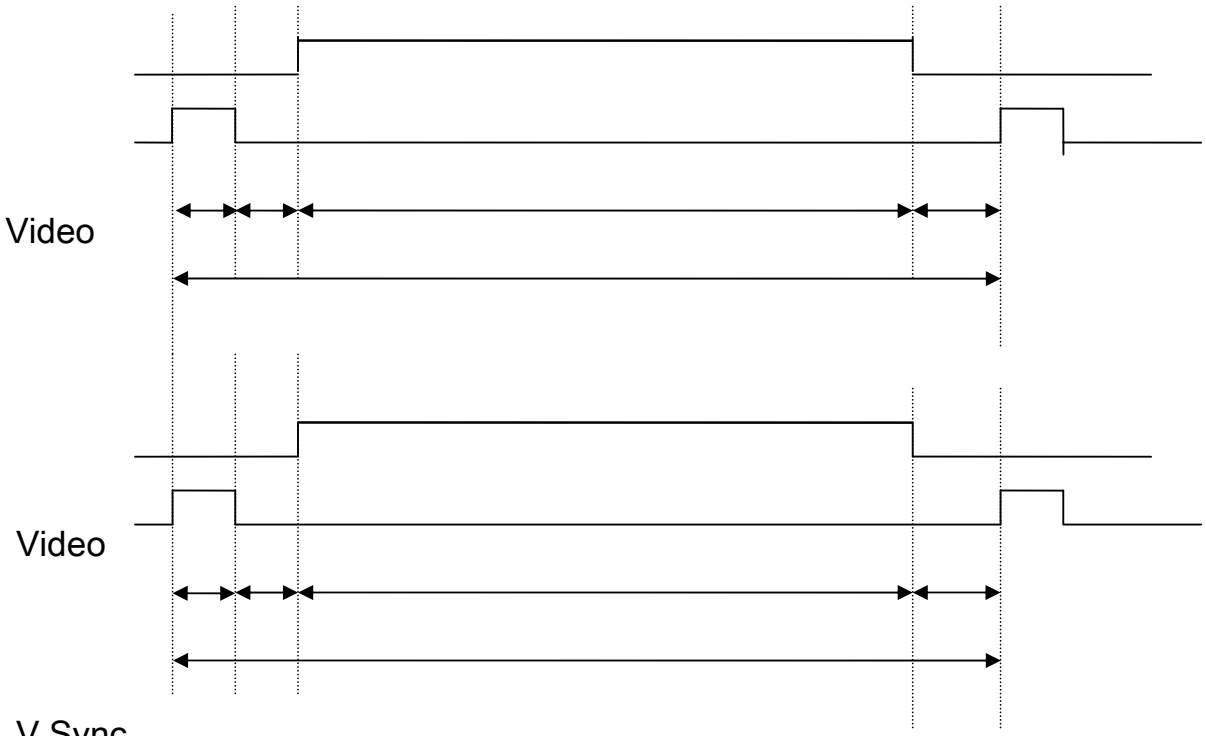
Display Format	IBM VGA		VESA	VESA	VESA	VESA	VESA
Horizontal Dots	720	640	640	640	800	800	800
Vertical lines	400	480	480	480	600	600	600
Horizontal Frequency	31.469		37.861	37.5	37.879	48.077	46.875
Vertical Frequency (Hz)	70	59.94	72.809	75	60.317	72.188	75.000
Pixel Rate (MHz)	28.322	25.175	31.5	31.5	40	50	49.5
H. Sync. Polarity	-	-	-	-	+	+	+
A μS (Period)	31.778		26.413	26.667	26.4	20.8	21.333
B μS (Pulse Width)	3.813		1.270	2.032	3.2	2.4	1.616
C μS (Back Porch)	1.907		4.063	3.810	2.2	1.28	3.232
D μS (Active Area)	25.422		20.317	20.317	20.0	16.0	16.162
E μS (Front Porch)	0.636		0.763	0.508	1.00	1.12	0.323
V. Sync. Polarity	+	-	-	-	+	+	+
O ms (Period)		16.683	13.735	13.333	16.579	13.853	13.333
P ms (Pulse Width)		0.064	0.079	0.080	0.106	0.125	0.064
Q ms (Back Porch)		1.048	0.739	0.427	0.607	0.478	0.448
R ms (Active Area)	12.711	15.253	12.678	12.800	15.840	12.480	12.8
S ms (Front Porch)		0.318	0.237	0.027	0.026	0.770	0.021

Display Format	VESA	VESA	VESA	VESA	VESA	VESA
Horizontal Dots	1024	1024	1024	1152	1280	1280
Vertical lines	768	768	768	864	1024	1024
Horizontal Frequency	48.363	56.746	60.023	67.5	63.981	79.976
Vertical Frequency (Hz)	60.004	70.069	75.029	75	60.013	75.025
Pixel Rate (MHz)	65.0	75	78.75	108	108	135
H. Sync. Polarity	-	-	+	+	+	+
A μS (Period)	20.667	17.707	16.660	14.815	15.631	12.504
B μS (Pulse Width)	2.092	1.813	1.219	1.185	1.180	1.067
C μS (Back Porch)	2.462	1.920	2.235	2.370	2.065	1.837
D μS (Active Area)	15.754	13.653	13.003	10.667	11.797	9.481
E μS (Front Porch)	0.369	0.321	0.203	0.593	0.590	0.119
V. Sync. Polarity	-	-	+	+	+	+
O ms (Period)	16.666	14.272	13.238	13.333	16.663	13.329
P ms (Pulse Width)	0.124	0.106	0.050	0.044	0.047	0.038
Q ms (Back Porch)	0.6	0.513	0.466	0.474	0.594	0.475
R ms (Active Area)	15.88	13.599	12.795	12.8	16.006	12.804
S ms (Front Porch)	0.062	0.054	0.017	0.015	0.016	0.012

VGA Support Mode

1280 * 1024 @70Hz, 72Hz
1280 * 960 @ 60Hz, 70H, 72Hz, 75Hz
1280 * 720 @ 60Hz
1152 * 864 @ 60Hz, 70Hz, 72Hz
1024 * 768 @ 72Hz
800 * 600 @ 70Hz
640 * 480 @ 70Hz
640 * 350 @ 70Hz

Timing Chart



3.3 Plug & Play DDC 2B data transmission only for I^2C BUS interface card.

3.4 Scanning characteristics

	VGA
Horizontal frequency	30KHz to 80KHz
Refresh rate	59Hz to 75Hz

3.5 Audio Module

3.5.1. Type:	Stereo BTL audio output amplifier with DC volume control with two 1W speakers.
3.5.2. Input Level:	1Vrms
3.5.3. Output Power:	1W * 2 (10% THD, 1KHz)
3.5.4. Total Harmonic Distortion (THD):	0.3% (Typ.) (0.5W * 2, 1KHz)
3.5.5. Frequency Response ±3dB:	550Hz ~ 20KHz
3.5.6. Channel unbalance (output power):	1dB (max.)

3.6 User Controls and Indicator

3.6.1 Power ON/OFF Switch	The switch control scaler power down and turn off panel.
3.6.2 LED Indicator	The LED color shall indicate power status as shown in paragraph 3.7
3.6.3 OSD	
3.6.3.1 Buttons	ESC , ▽ , △ , ↵
3.6.3.2 OSD Menu Level	See Table 2. S962A OSD Control Map
3.6.4 Hot Keys Function	
3.6.4.1 Contrast (◐)	Press "△ " to pop up ;then press "△ " or "▽ " to adjust Contrast up or down.
3.6.4.2 Brightness (☼)	Press "▽ " to pop up ;then press "△ " or "▽ " to adjust Brightness up or down.
*3.6.4.3 Mute On ( )	Press "Esc" directly to disable speakers, while speakers in normal state.
*3.6.4.4 Mute Off ( )	Press "Esc" directly to enable speakers, while speakers in audio mute state. "Esc" key is for Mute On and Off function
*3.6.4.5 In monitor power saving mode	"△ " key is for increasing volume function. "▽ " key is for decreasing volume function. "ESC" key is disable or enabling audio mute.

Table 2 S962A OSD Control Map

1.VGA-D15 input:

	Level 1	Level 2	Level 3	Level 4
Direct Adj	Brightness			
Direct Adj	Contrast			
Direct Adj	Audio Mute			
Main Menu	Volume	Adjustment scale		
	Auto Tune			
	Color	Auto Color		
		9300° K		

		6500° K		
		User	R/G/B select	Adjustment scale
	Image	Clock	Adjustment scale	
		Phase	Adjustment scale	
		H-Position	Adjustment scale	
		V-Position	Adjustment scale	
		Smooth	On/Off	
	Language	English(select)		
		German(select)		
		French(select)		
		Spanish(select)		
		Italian(select)		
		中文(option)		
	OSD Position	H-Position	Adjustment scale	
		V-Position	Adjustment scale	
		Center		
	Reset	Yes/No		

3.6.5 Accessory OSD Indications

Signal out of range	An input signal which is outside the range defined in Section 3.4 shall cause the monitor to display a message **Signal Out of Range**.
No Signal Input and power down.	When the signal cable is not plugged into PC or when the horizontal or vertical sync are absent and when the monitor is turned on. After 5 sec isn't to detect H or V Sync then show "**No Signal Input**" for 5 seconds and then show " **Power down**" message on screen 2 sec. And then the monitor shall go to power saving status. If first turn on the monitor, shows **"No Signal Input"** 30 sec.

3.7 Power Management

This monitor will meet the low power specification, Including USA governmental requirements For Energy Star, the NUTEK standard and the VESA DPMS standard which detected the Hori. /Vert. Sync signal from host CPU.
A dual color (green/amber) LED is located on the front bezel to indicate the power management states.

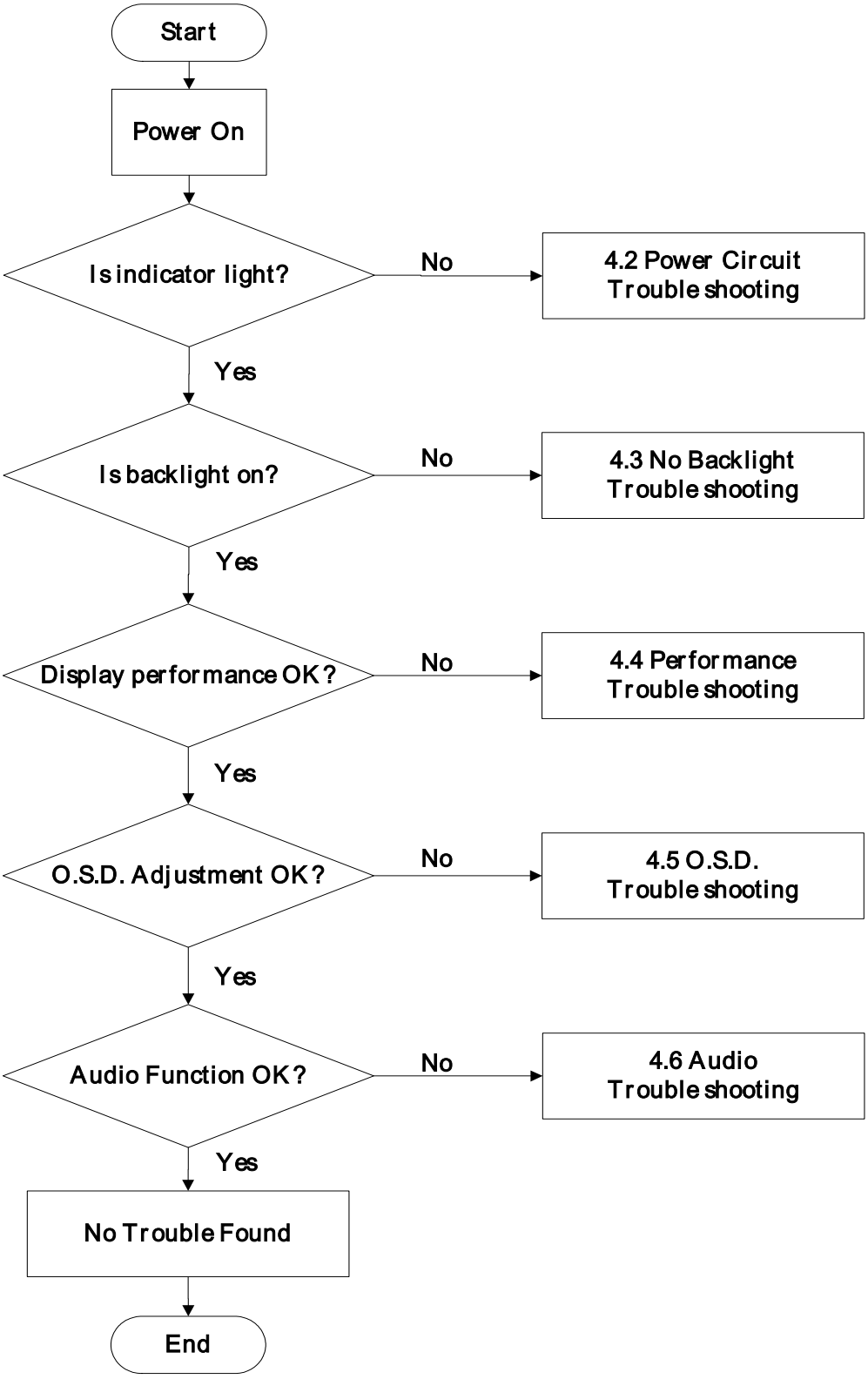
Status		Power consumption	Power management	Picture Recovery time	LED Color
Sync.	Video				
Active	Active	43W max.	On	-	Green
No Sync.	Blanked	≦ 2W (Note.1)	Power saving	≦ 3 sec	Amber

Note. 1 : Audio function is operating at no signal input.

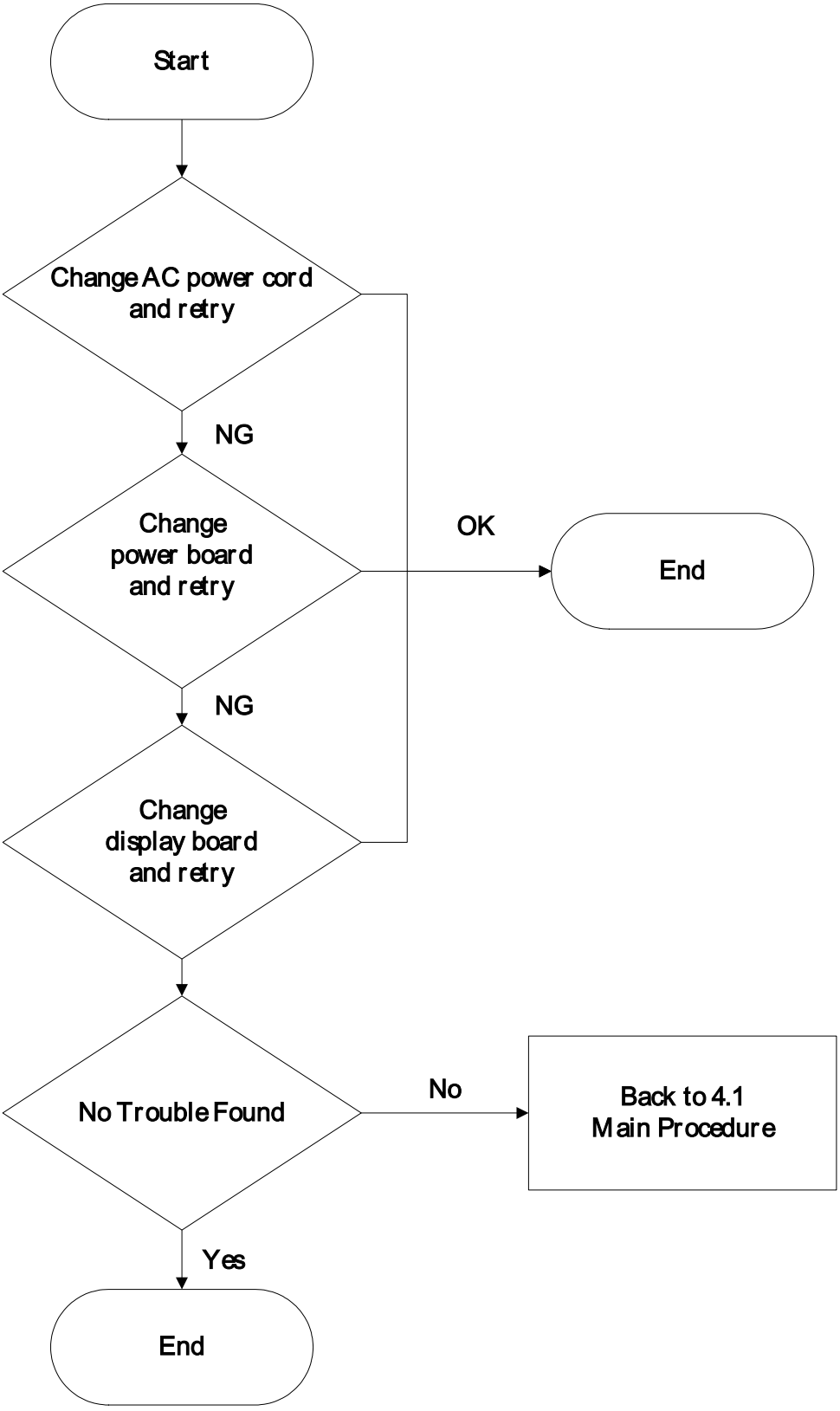
Once "Esc" or "△ " or "▽ " key initiates under power saving condition, the audio function an be waked up and the power consumption can not be the above definition.

4. TROUBLE SHOOTING

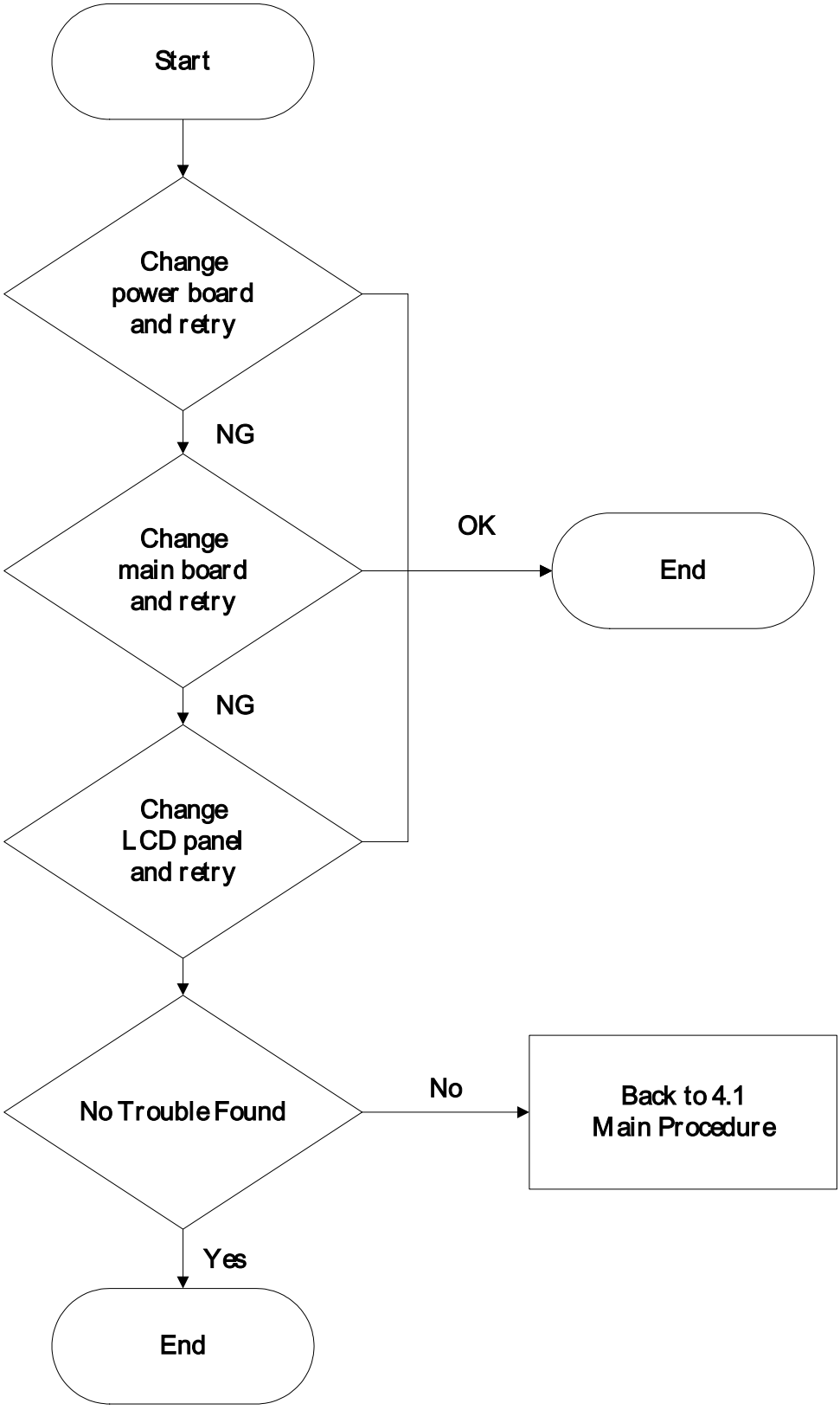
4.1 Main Procedure



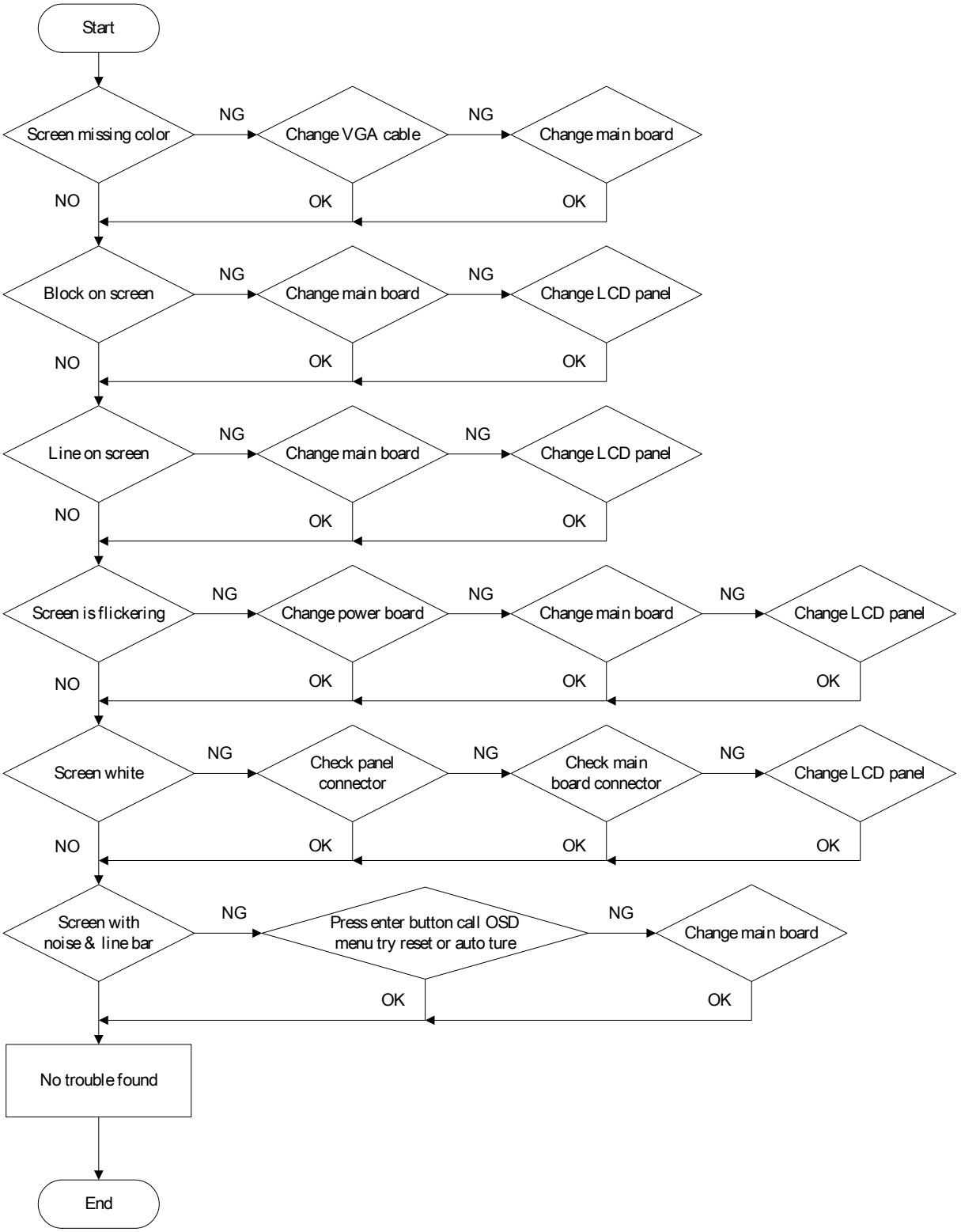
4.2 Power Circuit Trouble Shooting



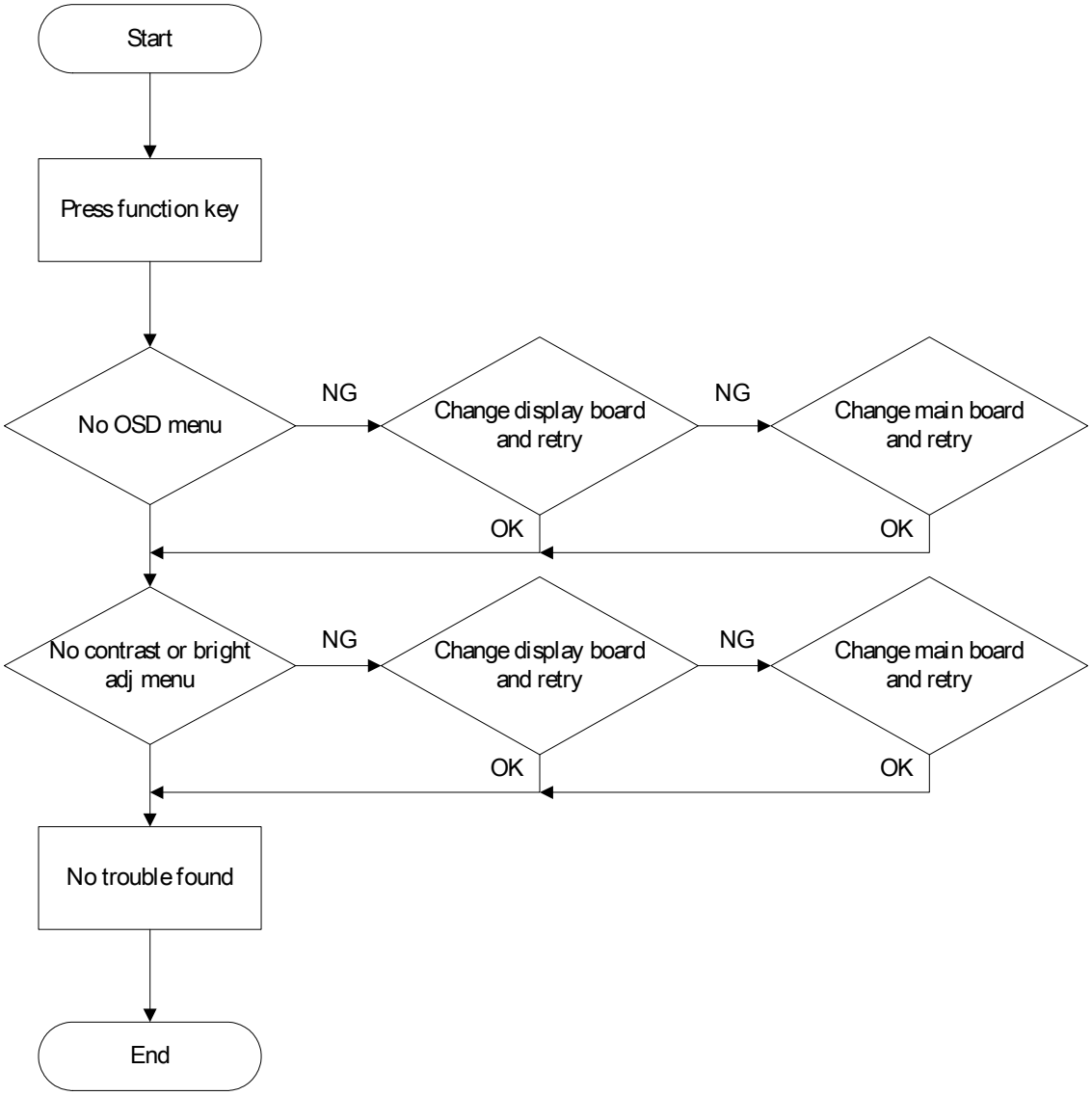
4.3 Backlight Trouble Shooting



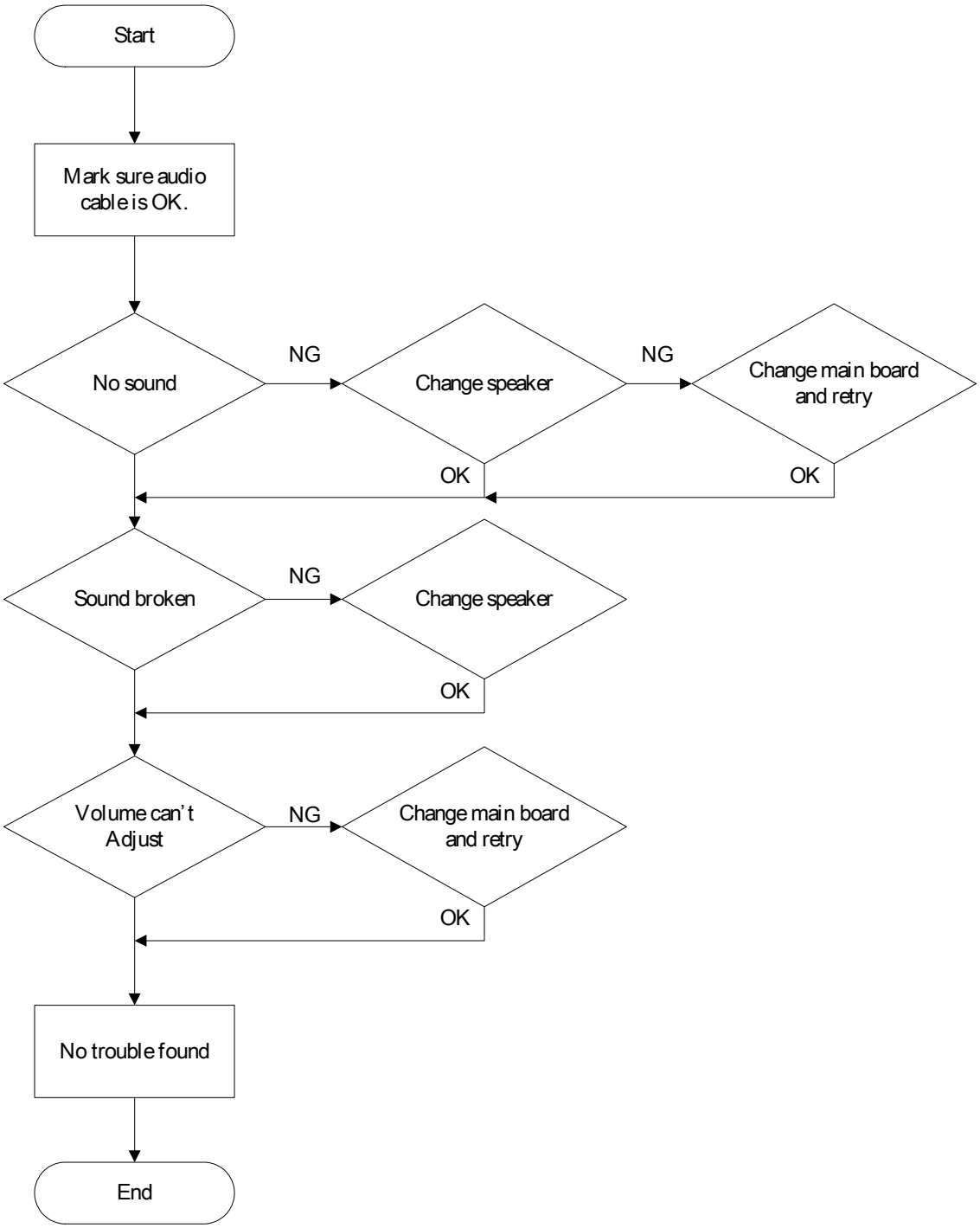
4.4 Performance Trouble Shooting


Start
Screen missing color
NG
Change VGA cable
NG
Change main board
NO
OK
OK
Block on screen
NG
Change main board
NG
Change LCD panel
NO
OK
OK
Line on screen
NG
Change main board
NG
Change LCD panel
NO
OK
OK
Screen is flickering
NG
Change power board
NG
Change main board
NG
Change LCD panel
NO
OK
OK
OK
Screen white
NG
Check panel connector
NG
Check main board connector
NG
Change LCD panel
NO
OK
OK
OK
Screen with noise & line bar
NG
Press enter button call OSD menu try reset or auto ture
NG
Change main board
OK
OK
No trouble found
End

4.5 O.S.D. Trouble Shooting



4.6 Audio Trouble Shooting



PARTS LIST

ITEM	PART NUMBER	DESCRIPTION
1	AC1921-B01	MAIN PCBA
2	DC1921-B01	POWER PCBA
3	GC1921-B01	DISPLAY PCBA
4	10A19-1A2A	LCD TFT 1280*1024 AU
5	SSBASE-508	SUB ASSY BASE
6	04007983000H	CARTON
7	05101668000H	HOLDER (R)
8	05101678000H	HOLDER (L)
9	05Z0001900E	PLASTIC HANDLE BAR
10	05Z0002900E	PLASTIC CLAP BOARD
11	06208061000H	USER MANUAL
12	65B70-1801ZH	CABLE AUDIO
13	98T111-P62	DISKETTE 3.5IN 1.44M
14	65S10-150CZH	CABLE SIGNAL